A Comparative Study of Selected Physiological, Physical and Anthropometric Variables among the Players of Indigenous and Non-indigenous Games

A

THESIS

By

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Chapter I

INTRODUCTION

From the recent year, attention has been focused on the identification of various anthropometry physiological and physical variables that distinguish between elite athletes from different sport. The results of this research will suggest that each sport is characterized by athletes with particular physical, physiological, and anthropometric attributes favoring performance in their given sports.

There are numerous factors which are responsible for the performance of a sportsman with the innumerable variety of human physique. It has become a generalized consideration that some sports events are more suitable to individuals with specific physique than others. It has been well established that specific physical characteristics, physiological or anthropometric profile indicate whether the players would be suitable for the competition at the highest level in a specific sport. These variables play an important role in determining the success of an athlete.

Anthropometry is branch of ergonomics that deals specifically with the measurement of people, particularly with measurement of body size, shape, strength and working capacity.

The Physical variables may be defined as those variables which are essential for efficient functioning in the psychomotor domain. These variables are performance-oriented and are dependent upon functioning of different systems of the body in integrated manner.

Physiological variables may be defined as those variables which are directly linked with various physiological systems such as pulse rate, blood pressure, vital capacity fat percentage, respiratory rate, hemoglobin

The rural population of India, comprising about 70 per cent of the country's total population possess higher level of physical fitness, physiological and morphological status than the people residing in urban areas, seems to be a pillar of strength in the Country's sports arena. Physical Education and Sports in India have held great importance throughout India's history for a number of reasons. Several different games are played in the country with their origin in ancient times. Often they are played during festivals for physical development and recreational entertainment. Playing such games may aid in the promotion of physical prowess and multilateral motor development.

Kabaddi

Kabaddi is aptly known as the “Games of The mass” due to its popularity, simple, easy to comprehend rules, and public appeal. The game calls for no supplicated equipment what so ever, which it very popular sport in the developing countries. Though it is basically an outdoor sport played on clay court, of late the game is being played on synthetic surface indoors with great success. The duration of the game if 45 minutes for men & junior boys with a 5 minutes break in between for the teams to change sides in the case of women/girls & sub-junior boys, the duration of 35 minutes with a 5 minute break in between Kabaddi is a combative team game, played with absolutely no equipment, in a rectangular court, either outdoors with seven players on the ground in each side. Each side takes ultimate chances at offence and defense

Kho-Kho

Kho-Kho, an ancient game of undivided India, Probably was derived from the different strategy and tactics of “Kurukshetra” was in Mahabharata. The game of Kho-Kho is based on natural principals of physical developments. It is vigorous and fosters a health combative spirit among youth. It is not merely running with speed but its CHASE a natural instinct to overtake, to pursue to catch a kill. No doubt speed is the heart and to stand to a relentless pursuit of a minutes at a stretch (turn) this heart demand stoutness stamina. In turn a physically fit youth enjoys it and the spectators who watch enjoy a trilling sport to their satisfaction. The game is played in two innings. A team consists of 15 players. However 12 players are nominated for a match and only a take to the actual game initially. Every team has to chase and defend for 26 a minutes each twice in a match that thus consists of a 2 innings. Chasing or defending once in an inning is termed a “Turn” of the particular act.

Handball

Handball is a modern ball game which belongs to the family of team sports. It combines the best features of different branches of sport, that is, the advantages of physical abilities, technical skills and tactical knowledge.

All human creations are subject to constant change, the game of handball is not an exception. The technical abilities have been improved, tactical systems refined, and laws of the game adapted to a more modern 15 concept. Since 1952 indoor handball has been gaining more and more ground. Indeed, handball became a universal sport and

its popularity has increased quite obviously. The game is characterized by two alternating sides the attack and the defense with the purpose to score or obstruct the goal.

The attack starts the moment the team gains possession of the ball and lasts until they lose it. During this period the attackers try to score in the different phases of the attack by employing individual, group or team technicaltactical elements of attack.

The defense starts the moment the team loses possession of the ball and lasts until they gain it back. During this period, the defenders try to obstruct the opponent's scoring attempts in the different phases of the defense by employing individual, group or team technical-tactical elements of defense.

Basketball

Basketball is one of the most popular among the modern games. According to people's demand Luther Gulick and Frank Peters have requested Dr. Naismith to originate a new indoor game so that peoples can play in very cold winter at Massachusetts. The concept of Basketball has been created from Naismith's school days where he uses to play a game known as duck-on-a rock. First time the game "Basket Ball" has been played in Armory Street court in December 1891. At the beginning, a team consisting of nine players use to play against opponent using Soccer ball instead of Basketball, and the goals are a pair of peach big basket of fruit hanging on the wall of the Gymnasium. The peach baskets are closed, and balls have to 2 be retrieved manually by cutting a small hole in the bottom of the peach basket and poking the ball out using a stick

Statement of the problem

The present study focused on comparison of selected physiological, physical and anthropometric variables among the players of indigenous and non-indigenous games.

Objectives of the study

- The purpose of the present study is to compare the selected physiological, physical and anthropometric variables among the players of indigenous and non-indigenous games.

Hypotheses

- There may be a significance difference in physiological variables among the players of indigenous and non-indigenous games
- There may be a significance difference in physical variables among the players of indigenous and nonindigenous games.
- There may be a significance difference in anthropometric variables among the players of indigenous and non-indigenous games.

Delimitations

On the basis of available literature and on personal interest of scholars the study will be delimited to:

- Two Indigenous Games kho-kho and Kabaddi and two Nonindigenous Games: Basketball and Handball.
- Male players of university level aged ranges between21to25 years
- Total 200 players 100 in each game category (indigenous and non-indigenous)
- The study will be delimited to following variables:

Physiological variables

Resting heart rate

Vital capacity

Blood pressure

Body mass index

VO_2 max

Physical variables

Agility

Explosive strength

Flexibility

Speed

Anthropometric variables

Height

Weight

Arm length

Leg length

Terminologies and Definition

Vital capacity

The maximum volume of gas that can be expelled from the lungs following a maximal inspiration is called vital capacity.

Blood pressure

Blood pressure is the lateral pressure exerted by blood of the vessels wall while flowing through it.

Body mass index

Body mass index is a value divide from the mass and height of person. The BMI is defined as the body mass divided by the square of the body height.

VO2 max

The maximum or optimum rate at which the heart, lungs, and muscles can effectively use oxygen during exercise, used as a way of measuring a person individual aerobic capacity.

Agility

Agility is the capacity to change the directions quickly and to control body movements.

Explosive power

Explosive power is defined as the ability of a muscle or a group of muscles to release maximum force in the shortest possible time in one explosive manner.

Flexibility

Flexibility is the range of movement possible around a joint or a series of joints.

Speed

Speed may be defined as rapidity with which successive movements of the same kind are performed.

Height

It is the erect body length from the sole of the foot to the vertex on the head.

Weight

The weight of the body is the gravitational force exerted on it by earth.

Arm length

Arm length is the distance from acromion process to the tip of the third finger.

Leg length

Leg length is defined as the distance between greater trochanter to the outside edge of the foot.

Significance of the Study

- The study will help to compare physiological physical and anthropometric variables among the players of indigenous and non-indigenous games
- The findings of the study will be the significance of self-assessment of physiological, physical and anthropometrical variables of indigenous and non-indigenous game players.
- The study will help to making a training schedule for the players, coaches, trainers, and Physical Education teachers of indigenous and non-indigenous games for developing different structure pertaining to these games.
- The study will be the significant to choose the sportsperson for indigenous and non-indigenous games on the basis of the analysis and measurement of physiological physical and anthropometrical measurements as possessed by one individual.

Chapter II

REVIEWS OF RELATED LITERATURE

Vishal (2019) have studied to compare anthropometric and physical variables among cricket and baseball players, for this study 100 subjects from cricket and 100 subjects from baseball players were taken from different universities of Haryana. The conclusion of the study confirmed that a significant difference was noticed in anthropological and physiological variables-weight, height, total leg length, total arm length, sitting height, soldier circumference, chest circumference, abdomen circumference, hip circumference, biceps, triceps of Cricket and Baseball players. These anthropological and physiological variables of baseball players were found higher in comparison to cricket players. Regarding subscapular, suprailiac, heartrate, vital capacity, diastolic and blood pressure of cricket and baseball players, nonsignificant difference was found.

Singh parvinder (2012) purpose of the study is to compare selected physiological and anthropometrical variable of Kho Kho and kabaddi players of Haryana. For this study 120 male Kho Kho and 120 male kabaddi players were selected. It was concluded that there is no significant difference was found in total leg length, thigh length, upper arm length, hand length, trunk length between kho -kho and kabaddi players. Regarding body circumferences there is no significant difference was found in abdomen, Regarding bone diameter there is no significant difference was found in bitrochanteric diameters and femur bicondylar between Kabaddi and Kho-Kho players. Regarding skin-fold, there is no significant difference was found in triceps, subscapular, thigh and calf between Kabaddi and Kho-Kho players. In case of physiological parameters, there is no significant difference was found in systolic blood pressure, FEV1 and PEF between Kabaddi and Kho-Kho players.

Malathy E (2003) purpose of study is to compare physical physiological anthropometrical biochemical and hematological variables among Tamilnadu state women soccer basketball volleyball and hockey players. To achieve the purpose Tamilnadu state women hockey soccer volleyball and basketball players were selected as subjects from those who have participated in the national level competition and inter state championship. Under physical variables, the height, weight, percent body fat,

,agility and explosive power were studied. In height soccer and volleyball players were taller than hockey and basketball players. In weight, the volleyball players were heavier than the other three groups, but the result was not significant. In percent body fat, the hockey women players scored the lowest value whereas the soccer players scored the highest. In agility, soccer state women players scored the lowest, followed by basketball, hockey and volleyball players. In explosive leg strength, volleyball players had more explosive power, followed by hockey, basketball and soccer players. Thus, in the physical variables, it was concluded that all the four groups differed in height, weight, percent body fat, agility and explosive power.

Kaur Rajinder (2016) purpose of the study is to compare selected anthropometric psychological variables between women handball and basketball players to achieve this study the investigator took 200 female handball and basketball players of college and state level as subjects of the study. In anthropometric, psychological and physiological, measurements, the results the study indicate that high level female Basketball and Hand Ball players inter college level group were found significantly better statistically in all the 15 anthropometric measurements, psychological variables i.e. adjustment and anxiety, physiological variables only in & blood pressure systolic better than state level basketball, handball are inter college having lesser blood pressure than state level groups of players.

Sarvanakumar, N (2016) purpose of the study is to compare Indian university female soccer players on selected anthropometric, physiological and psychological variables according to their playing position. To execute the study, 238 female soccer players who had participated in the south west zone and all India interuniversity women football tournament organized by periyar university, Salem, tamilnadu were utilized. Goalkeepers, defenders, midfielders and forward were different on anthropometrical and physiological characteristics. There is difference between goal keeper and defenders, goal keeper and mid fielders, goal keepers and forwards, defenders and midfielders, defenders and forward, mid fielders and forwards are significant at 0.05level.

Sridhar Kumar, G R. (2005) purpose of the study is to find out the relationship of selected physical anthropometrical and psychological variables with performance in

kabaddi. To achieve this study 75 male kabaddi players were selected from different universities of Karnataka among the selected six physical variables only speed, agility, leg explosive power and arm strength endurance were found to be significant correction with the performance in the kabaddi and flexibility, cardiovascular endurance were found to be not significantly correlated with the performance in kabaddi among the selected five anthropometric variable only weight, arm length and leg length were found to be significant correlated with performance in the kabaddi and trunk length, height were found to be not significant correlated with the performance in kabaddi.

BharskhleS. Y daorao (2004) the purpose of this study was to compare the physical and anthropometric variables among tribal, rural and urban high school boys. 900 high school boys were selected as subject for the study in each group consisted of 300 hundred subjects to evaluate. The performance of the subject in the anthropometric and physical test were conducted. There was significant difference between Urban-Tribal groups school boys in Shuttle run for agility but the difference between urban-rural and rural tribal was insignificant. There was significant difference between urban and tribal groups in standing broad jump for leg power. . But the difference between rural and urban and rural group was insignificant. There was significant difference between Urban and tribal group in pull-ups for arm strength but the difference between urban-rural and rural-tribal group was insignificant. There was significant difference between urban-tribal groups in arm length but the difference between rural -tribal and Urban - Rural group was insignificant. There was significant difference between tribal urban groups in height. But the difference between rural- urban and tribal-rural groups was insignificant. was no significant difference among the there group so high school boys in weight.

Gajedra, Prakash (2011) the purpose of the study was to compare physical and physiological profiles of basketball and handball players. The subject for this study were 35 basketball and 35 handball players, who were selected for junior national coaching camp which was conducted at national institute of sports Patiala. In agility, arm and shoulder strength endurance, arm and shoulder girdle explosive strength, leg explosive strength, flexibility and cardio respiratory endurance of basketball and handball players are equal. In pulse rate systolic blood pressure, diastolic blood pressure and maximum expiratory pressure of basketball and handball players have

similar profiles. The basketball players and handball players have no difference in skinfold measurements of biceps, triceps, calf and thigh regions.

Chapter III
METHODOLOGY

The following account describes the design of the study in details about the subjects, collection of data, variables selected and the statistical procedure for analyzing the data.

Selection of the Subjects

For the purpose of the study total 200 male players will be selected from indigenous and non-indigenous games (100 in each) from various universities of Karnataka aged ranges between21-25 years. The subjects will be selected from the universities randomly 50 from each four games.

Selection of variables

Reviewing the literature and considering the feasibility especially from the point of view of availability of equipment and time factor for the study the following physiological, physical, and anthropometric variable will be selected.

Physiological variables

Resting heartrate

Vital capacity

Blood pressure

Body mass index

VO_2 max

Physical variables

Agility

Explosive strength

Flexibility

Speed

Anthropometric variables

Height

Weight

Arm length

Leg length

Administration of tests

Before the conduct of tests, the researcher will demonstrate each test to the subjects. A model performance by a few persons other than the active participants will be done to make them clearly understand the test procedures. The test items and the procedure for the administration in the present study are explained below.

Physiological variables

Resting pulse rate:

Purpose-the purpose of the this test is to measure the number of pulse rate per minute

Equipment required- the pulse rate of all the subjects will be recorded in lying supine position in the morning time.

Scoring-the recorded pulse rate on the board of the monitor is an accounted the resting pulse rate of the subjects per minute.

Vital capacity:

Purpose: To measure the vital capacity of lungs

Equipment- spirometer

Procedure- the subject will be asked to take two or three deep breaths and then after the deepest possible inspiration, spirometer is placed on his mouth then he expired the air

into that spirometer with full force.

Scoring- the reading in the spirometer are vital capacity of subjects in liters

Blood pressure:

Purpose-to measure blood pressure per minute

Equipment required-digital blood pressure monitor

Procedure- blood pressure of the subjects will be measured with the help of digital blood pressure monitor by fastening around the subject left arm.

Scoring- the recorded blood pressure on the board of the monitor is accounted as the blood pressure of the subject.

BMI:

Purpose-to measure body mass index

Procedure- BMI will be calculated with following formula

BMI = weight (kg)/height (m) x height (m)

VO_2max:

Purpose- to measure cardiorespiratory or endurance fitness.

Equipment required- 16.25 inches/ 41.3 cm bench (step), stopwatch, metronome, heartrate monitor (optional)

Procedure- the test gives steps up and down on the platform 24 steps per minute. The subjects are using a four step cadence, up-up down-down for 3 minutes. The tester gives stops immediately on completion of the test, and heart beats are counted using heart rate monitor, and use in the below formula

Scoring – VO_2 max can be calculated from the test results, using the formula (McArdle.Et.Al, 1972)

For men-

VO_2 max (ml/kg/min) =111.33-0.42xheartrate (bpm)

Physical variables:

Agility (t shuttle run)

Purpose- to measure the agility of the player

Equipment required- tape, marking, cones, stopwatch.

Procedure-the subject start at cone A the command of the timer, sprint towards cone B,

and touch, then shuttle sideward(left) and touch cone C, then shuttle sideward (right side) and touch cone D, again sideward towards cone(left)B, then backward towards cone A

Scoring–the best time of three trails will be recorded.

Explosive strength

Purpose-to measure the explosive strength of the subjects

Equipment-wall, measuring tape

Procedure- the subject will be asked stand with side to the wall keeping both feet flat on the floor. He will reach as high as possible with his middle finger touching the wall. This is his standing reach. Keeping color chalk powder on his middle finger he stand comfortable at a distance from the wall. On signal the subject swing both arms upward and jump vertically extending his hand and touch the wall with chalked finger.

Flexibility (sit and reach)

Purpose- to measure the amount of trunk flexion and the ability to stretch back muscles of the subject

Equipment required- sit and reach box

Procedure- the subject will be asked to sit on the floor with back and head against a wall, legs fully extended with the bottom of the feet against the sit and reach box and place hand on top of the box, stretching the arms forward while keeping the hand and back against wall.

Scoring-record the distance

Speed (50 mtr dash)

Purpose–to measure speed of the player

Equipment required– marked track, stopwatch, cone, and marker.

Procedure- the test involves running a single maximum sprint over 50mtr with the time record.

Scoring – the time taken from the first movement till the chest crosses the finish line will be recorded as the score.

Anthropometric variables

Height:

Purpose- to measure the height of the subject

Equipment required- stediometer

Procedure-the subject will be asked to stand up right against a wall and their height will be recorded using stediometer

Weight:

Purpose- to record the weight of the subject

Equipment required – weighing machine

Procedure–the subject will be asked to step on the weighing machine in erect posture. The weight will be recorded

Arm length:

Purpose-to measure the arm length of the subjects

Equipment required- measuring tape

Procedure–the subjects will be asked to stretch their right arm perpendicular to their body, their arm length will be measured in centimeters using a measuring tape from the shoulder joint (acronym process) to the middle finger tip.

Leg length:

Purpose– to measure the leg length of the subject

Equipment–measuring tape

Procedure – the subjects stand in bare feet with a tape the length of the leg will be estimated from greater trochanter to floor.

Physiological variables

Variables	**Tests**	**Criterion measures**
Resting heart rate	Heart rate monitor	Beats/minutes
Vital capacity	Peak flow measurement	millimeter
Blood pressure	Sphygmomanometer	Mmhg
BMI	Weight /(height)2	Kg/ cm2

VO_2 max	Harvard step test	Ml/kg/min

Physical variables

Variables	**Tests**	**Criterion measures**
Abdominal strength	Sit ups in one minute	In numbers
Agility	T agility run	In seconds
Explosive power	Vertical jump	In centimeters
Flexibility	Sit and reach test	In centimeters

Anthropometric variables

Variables	**Tests**	**Criterion measures**
Height	Stediometer	Cm
Weight	Weighing machine	Kg
Arm length	Measuring tape	Cm
Leg length	Measuring tape	Cm

STATISTICAL ANALYSIS

For the analysis of physiological, physical and anthropometric profile descriptive statistics mean, standard deviation, and percentile will be used and for the comparison between indigenous and non-indigenous games for the selected physiological, physical and anthropometric variables Multivariate Analysis of Variance will be employed at 0.05.

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